be applied to the vehicle of Fig. 1. The wheel brakes 46 can be used as service brakes in addition to the front and rear clutches 21, 22, which serve as hydraulic brakes. See Specification at page 30, lines 6-9. The recitation in claim 9 is therefore believed correct and definite. Accordingly, Applicants respectfully request the rejection of claim 9 under 35 U.S.C. §112 be withdrawn.

Rejections under 35 U.S.C. § 102

2. Claim 45 was rejected under 35 U.S.C. § 102(b) as being anticipated by May et al. (U.S. Pat. No. 5,431,241). Applicants have canceled claim 45, thus rendering moot the rejection of this claim.

Rejections under 35 U.S.C. § 103

3. Claims 1 and 3 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Iwata (U.S. Pat. No. 5,279,382). Applicants believe that this rejection is now rendered moot in light of the above amendments and the following remarks.

Claim 1 has been amended to incorporate the subject matter of claim 2, which the Examiner indicated as containing allowable subject matter. Thus, claim 1 is now believed allowable. Claim 3 has been amended to depend from claim 5, which the Examiner indicated as containing allowable subject matter. Thus, claim 3 is now believed allowable. Accordingly, Applicants respectfully request the rejection of claims 1 and 3, under 35 U.S.C. §103 as being unpatentable over Iwata, be withdrawn.

4. Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Iwata in view of Matsuda (U.S. Pat. No. 4,771,850). Applicants respectfully traverse this rejection.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." MPEP §2143.03 (citing In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

Claim 4 has been amended to be in independent form, including the features of claim 1. Amended claim 4 recites that the controller maintains braking force of the hydraulic brake at the normal value, regardless of rotational deceleration, when the vehicle speed is lower than a predetermined determination value.

When the vehicle speed V is lower than the determination value V1, the vehicle speed V is relatively low and the vehicle is about to stop. In this state, intermittent braking, i.e., ABS control, is undesirable. Therefore, if the vehicle speed V is lower than the determination value V1, the braking is not suspended if the acceleration α (in this embodiment, α represents negative values, i.e., the rotational deceleration of the wheel) is lower than the determination value α_0, and thus the vehicle is permitted to stop smoothly. See Specification page 23, lines 25-32.

Iwata is directed toward a *traction control and ABS system*, and Matsuda is directed toward *traction control system* for a vehicle, which reduces wheel spin to allow a vehicle to safely *start moving*. Traction control is executed when a vehicle begins to move, but is not executed when the vehicle is being braked. Claim 4 relates to ABS control, which is executed when the vehicle is being braked.

The Examiner stated that Iwata "fails to specifically teach that the traction and slip control does not affect the degree of braking when the vehicle speed is below a predetermined value." In connection with Claims 1 and 3, the Examiner stated that Iwata also "fails to explicitly teach a torque converter and transmission in the vehicle...." See Office Action

at page 4. Matsuda does not remedy all of the deficiencies on Iwata in teaching or suggesting the subject matter of amended claim 4.

The Examiner stated that "Matsuda teaches a traction control system for a vehicle, wherein traction control is disabled or reduced in gain for vehicle speed below a threshold values." See Office Action at page 4. Applicants respectfully submit that traction control, for *reducing* excess wheel driving force when **accelerating** a vehicle is not the same as, and in fact, is completely contrary to *not reducing* excess wheel braking force when **decelerating** a vehicle. Thus, claim 4, as amended, is believed patentable over Iwata and Matsuda, alone or in combination. Therefore, claim 4 is patentable over Iwata in view of Matsuda. Accordingly, Applicants respectfully request the rejection of claim 4 as being unpatentable over Iwata, in view of Matsuda, be withdrawn.

5. Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Iwata in view of Rieker et al. (U.S. Pat. No. 6,339,749). Applicants respectfully traverse this rejection.

Claim 8 depends from claim 1, and therefore recites all of the features of claim 1. As mentioned above, claim 1 has been amended to incorporate the allowable subject matter of claim 2. Since claim 1 is believed allowable, so too is claim 8. Accordingly, Applicants respectfully request the rejection of claim 8 under 35 U.S.C. §103(a) as being unpatentable over Iwata in view of Rieker et al. be withdrawn.

6. Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over Iwata in view of Buschmann (U.S. Pat. No. 5,312,169). Applicants respectfully traverse this rejection.

Claim 10 depends from claim 1, and therefore recites all of the features of claim

1. As mentioned above, claim 1 has been amended to incorporate the allowable subject matter of claim 2. Since claim 1 is believed allowable, so too is claim 10. Accordingly, Applicants respectfully request the rejection of claim 10 under 35 U.S.C. §103(a) as being unpatentable over unpatentable over Iwata in view of Buschmann be withdrawn.

7. Claim 48 was rejected under 35 U.S.C. §103(a) as being unpatentable over Shimanaka, et al. (U.S. Pat. No. 5,150,761). Applicants respectfully traverse this rejection.

Claim 48 has been amended to recite, in part, "a pair of sensors, wherein each sensor detects the rotational speed of one of the driving wheels" and "a controller for controlling the clutches, wherein the controller computes the rotational accelerations of the driving wheels when the vehicle is accelerating based on the detected rotational speeds...." Amended claim 48 also recites, "the controller decreases the engaging force of one of the clutches that corresponds to the moving direction of the vehicle for decreasing power transmitted to the driving wheels." Simanaka, et al. does not teach or suggest this feature.

Shimanaka, et al. describes a system that adjusts an automatic transmission for the amount of torque being generated by an engine. See Shimanaka, et al. column 1, lines 52-63 and column 6, line 58 - Column 7, line 11. Shimanaka, et al. does not teach or suggest each and every feature of amended claim 48. Thus, claim 48, as amended, is believed patentable over Shimanaka, et al. Accordingly, Applicants respectfully request the rejection of claim 48 under 35 U.S.C. §103(a) as being unpatentable over Shimanaka et al. be withdrawn.

8. Claims 34, 38, 40 and 49 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shimanaka et al. (U.S. Pat. No. 5,150,761) in view of Buschmann. Applicants

respectfully traverse this rejection.

Claims 34 and 38 recite that the controller computes the rotational acceleration of the driving wheel when the vehicle is accelerating, based on the detected rotational speed. Claim 34 recites that when the computed rotational acceleration exceeds an acceleration determination value, which is predetermined for judging whether the driving wheel is skidding, the controller controls the engine output, to limit the power transmitted to the driving wheel. Claim 38 recites that when the computed rotational acceleration exceeds an acceleration determination value, which is predetermined for judging whether the driving wheel is skidding, the controller decreases an engaging force of one of the clutches that corresponds to the moving direction of the vehicle for decreasing the power transmitted to the driving wheel.

In contrast, as discussed above, Shimanaka, et al. describes a system that adjusts an automatic transmission for the amount of torque being generated by an engine. See Shimanaka, et al. column 1, lines 52-63 and column 6, line 58 - Column 7, line 11. Shimanaka, et al. does not teach or suggest each and every feature of claims 34 and 38, as amended. Buschmann does not remedy the deficiencies of Shiminaka, et al. in teaching these features.

Buschmann teaches that the angular velocity of the individual wheels is determined and that the wheel acceleration or wheel deceleration is determined. However, in Buschmann, a reference velocity of the vehicle, which corresponds to the vehicle speed, is derived from the velocity signals. The wheel slip is determined by comparing the individual wheel velocities with the reference velocity (column 2, lines 31-45). That is, Buschmann does not teach or suggest that the rotational acceleration of the driving wheel is compared with an acceleration determination value for determining the wheel slip, as recited in claims 34, 38.

Further, in the claimed invention, the acceleration determination value is

predetermined for judging whether the driving wheel is skidding. That is, the acceleration determination value is a fixed value. In Buschmann, the reference velocity of the vehicle is variable based on the velocity signals. Therefore, in the claimed invention, the slip-control procedure is simplified as compared to Buschmann. Thus, Claims 34 and 38 are believed patentable over Shimanaka et al. (US 5,150,761) in view of Buschmann.

Claim 40 depends from claim 38, and claim 49 depends from claim 48, which, as mentioned above, is believed patentable over Shiminaka, et al. (and Buschmann). Because of their respective dependencies, claim 40 incorporates the subject matter of claim 38 and claim 49 incorporates the subject matter of claim 48. Since claims 38 and 48 are believed patentable over Shimanaka et al. in view of Buschmann, so too are claims 40 and 49. Accordingly, Applicants respectfully request the rejection of claims 34, 38, 40 and 49 under 35 U.S.C. §103(a) as being unpatentable over Shimanaka et al. in view of Buschmann be withdrawn.

9. Claim 46 was rejected under 35 U.S.C. §103(a) as being unpatentable over May et al. in view of Buschmann.

Applicants have canceled claim 46, thus rendering this rejection moot.

Allowable subject matter

10. Applicants thank the Examiner for the indication of allowable subject matter of claim 9. As mentioned above, Applicants have amended claim 9 to be in independent form. Applicants believe that claim 9, as amended, is correct and definite. Accordingly, Applicants respectfully request the allowance of claim 9, as amended.

11. Applicants thank the Examiner for the indication of the allowable subject matter of claims 2, 5-7 and 11-29. As mentioned above, claim 5 has been rewritten in independent form, and claim 2 has been amended to depend from claim 5, and claims 6 and 7 depend from claim 5. Thus claims 2, and 5-7, as amended, are believed in condition for allowance.

Claim 11 has been rewritten in independent form. Claims 12 -29 depend either directly or indirectly from claim 11. Thus, claims 11-29 are believed in condition for allowance.

CONCLUSION

For these reasons, it is believed that all of the claims, as presently amended, are patentable, and that this application is in allowable condition.

Respectfully submitted,
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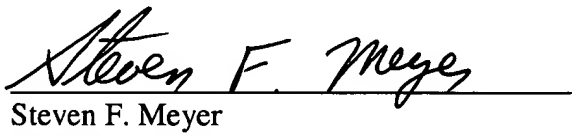
By: 

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APPENDIX I

Please amend claims 1-5, 9, 11, 34, and 38 as follows:

1. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a hydraulic brake for braking the driving wheel, wherein the hydraulic brake generates a braking force, the magnitude of which corresponds to a hydraulic pressure applied to the hydraulic brake;

a brake valve for adjusting the hydraulic pressure applied to the hydraulic brake;

a brake actuator, which is moved by a human operator to actuate the hydraulic brake;

a sensor for detecting the rotational speed of the driving wheel; and

a controller, wherein the controller controls the brake valve such that the hydraulic brake brakes the driving wheel with a force of a normal value, which corresponds to a force applied to the brake actuator, wherein the controller computes the rotational deceleration of the driving wheel while braking based on the detected rotational speed, and wherein, when the computed rotational deceleration exceeds a predetermined deceleration determination value, the controller controls the brake valve such that the braking force of the hydraulic brake is set to a limit value, which is smaller than the normal value,

wherein the hydraulic brake is one of a forward clutch and a reverse clutch, which

are included in the transmission, the forward clutch being engaged when the vehicle is moving forward, the reverse clutch being engaged when the vehicle is moving backward, each clutch producing an engaging force corresponding to an applied hydraulic pressure,

wherein the brake valve is one of a forward clutch valve for adjusting a hydraulic pressure applied to the forward clutch and a reverse clutch valve for adjusting a hydraulic pressure applied to the reverse clutch,

wherein, when the vehicle is moving forward, the reverse clutch functions as the hydraulic brake and the reverse clutch valve functions as the brake valve, and wherein, when the vehicle is moving backward, the forward clutch functions as the hydraulic brake and the forward clutch valve functions as the brake valve.

2. (Amended) The industrial vehicle according to claim [1] 5, wherein the hydraulic brake is one of a forward clutch and a reverse clutch, which are included in the transmission, the forward clutch being engaged when the vehicle is moving forward, the reverse clutch being engaged when the vehicle is moving backward, each clutch producing an engaging force corresponding to an applied hydraulic pressure, wherein the brake valve is one of a forward clutch valve for adjusting a hydraulic pressure applied to the forward clutch and a reverse clutch valve for adjusting a hydraulic pressure applied to the reverse clutch, wherein, when the vehicle is moving forward, the reverse clutch functions as the hydraulic brake and the reverse clutch valve functions as the brake valve, and wherein, when the vehicle is moving backward, the forward clutch functions as the hydraulic brake and the forward clutch valve functions as the brake valve.

3. (Amended) The industrial vehicle according to claim [1] 5, wherein the hydraulic brake is a hydraulic-clutch type parking brake.

4. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a hydraulic brake for braking the driving wheel, wherein the hydraulic brake generates a braking force, the magnitude of which corresponds to a hydraulic pressure applied to the hydraulic brake;

a brake valve for adjusting the hydraulic pressure applied to the hydraulic brake;

a brake actuator, which is moved by a human operator to actuate the hydraulic brake;

a sensor for detecting the rotational speed of the driving wheel; and

a controller, wherein the controller controls the brake valve such that the hydraulic brake brakes the driving wheel with a force of a normal value, which corresponds to a force applied to the brake actuator, wherein the controller computes the rotational deceleration of the driving wheel while braking based on the detected rotational speed, and wherein, when the computed rotational deceleration exceeds a predetermined deceleration determination value, the controller controls the brake valve such that the braking force of the hydraulic brake is set to a limit value, which is smaller than the normal value, [The industrial vehicle according to claim 1,]

wherein, when the vehicle speed is lower than a predetermined determination value, the controller maintains the braking force of the hydraulic brake at the normal value regardless of the rotational deceleration.

5. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a hydraulic brake for braking the driving wheel, wherein the hydraulic brake generates a braking force, the magnitude of which corresponds to a hydraulic pressure applied to the hydraulic brake;

a brake valve for adjusting the hydraulic pressure applied to the hydraulic brake;

a brake actuator, which is moved by a human operator to actuate the hydraulic brake;

a sensor for detecting the rotational speed of the driving wheel; and

a controller, wherein the controller controls the brake valve such that the hydraulic brake brakes the driving wheel with a force of a normal value, which corresponds to a force applied to the brake actuator, wherein the controller computes the rotational deceleration of the driving wheel while braking based on the detected rotational speed, and wherein, when the computed rotational deceleration exceeds a predetermined deceleration determination value, the controller controls the brake valve such that the braking force of the hydraulic brake is set to a

limit value, which is smaller than the normal value, [The industrial vehicle according to claim 1,]

wherein the controller controls the brake valve such that the braking force of the hydraulic brake is increased to the normal value after being decreased to the limit value, and wherein the normal value of the braking force is gradually decreased each time the braking force is increased to the normal value from the limit value.

9. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission; [The industrial vehicle according to claim 1, wherein the hydraulic brake is]

a hydraulic brake located in a power transmission path between the torque converter and the driving wheel to brake the driving wheel, wherein the hydraulic brake generates a braking force, the magnitude of which corresponds to a hydraulic pressure applied to the hydraulic brake;

a brake valve for adjusting the hydraulic pressure applied to the hydraulic brake;

a brake actuator, which is moved by a human operator to actuate the hydraulic brake;

a sensor for detecting the rotational speed of the driving wheel;

a controller, wherein the controller controls the brake valve such that the hydraulic brake brakes the driving wheel with a force of a normal value, which corresponds to a

force applied to the brake actuator, wherein the controller computes the rotational deceleration of the driving wheel while braking based on the detected rotational speed, and wherein, when the computed rotational deceleration exceeds a predetermined deceleration determination value, the controller controls the brake valve such that the braking force of the hydraulic brake is set to a limit value, which is smaller than the normal value; and [, and wherein the industrial vehicle includes]

a wheel brake located at the driving wheel to directly brake the driving wheel in response to actuation of the brake actuator.

11. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter, [The industrial vehicle according to claim 1,] wherein the transmission includes a hydraulic forward clutch, which is engaged when the vehicle is moving forward, and a hydraulic reverse clutch, which is engaged when the vehicle is moving backward, and wherein each clutch produces an engaging force, the magnitude of which corresponds to a hydraulic pressure applied to the clutch[, the industrial vehicle further comprising:] ;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a hydraulic brake for braking the driving wheel, wherein the hydraulic brake generates a braking force, the magnitude of which corresponds to a hydraulic pressure applied to the hydraulic brake;

a brake valve for adjusting the hydraulic pressure applied to the hydraulic brake;

a brake actuator, which is moved by a human operator to actuate the hydraulic brake;

a sensor for detecting the rotational speed of the driving wheel;

a controller, wherein the controller controls the brake valve such that the hydraulic brake brakes the driving wheel with a force of a normal value, which corresponds to a force applied to the brake actuator, wherein the controller computes the rotational deceleration of the driving wheel while braking based on the detected rotational speed, and wherein, when the computed rotational deceleration exceeds a predetermined deceleration determination value, the controller controls the brake valve such that the braking force of the hydraulic brake is set to a limit value, which is smaller than the normal value;

a forward clutch valve for adjusting a hydraulic pressure applied to the forward clutch;

a reverse clutch valve for adjusting a hydraulic pressure applied to the reverse clutch; and

a shift actuator, which is shifted between a forward position for moving the vehicle forward and a reverse position for moving the vehicle backward, wherein, when the shift actuator is shifted to the forward position, the controller controls the forward clutch valve to engage the forward clutch, and when the shift actuator is shifted to the reverse position, the controller controls the reverse clutch valve to engage the reverse clutch, and wherein, when direction switching is performed, in which the shift actuator is moved from the forward position to the reverse position or from the reverse position to the forward position while the vehicle is moving, the controller executes a vehicle deceleration control procedure for switching the

moving direction of the vehicle.

34. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter, wherein the transmission includes a forward clutch, which is engaged when the vehicle is moving forward, and a reverse clutch, which is engaged when the vehicle is moving backward;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a sensor for detecting the rotational speed of the driving wheel; and

a controller for controlling the engine, wherein the controller computes the rotational acceleration of the driving wheel when the vehicle is accelerating based on the detected rotational speed, and wherein, when the computed rotational acceleration exceeds [a predetermined] an acceleration determination value, which is predetermined for judging whether the driving wheel is skidding, the controller controls the engine output to limit the power transmitted to the driving wheel.

38. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter, wherein the transmission includes a hydraulic forward clutch, which is engaged when the vehicle is moving

forward, and a hydraulic reverse clutch, which is engaged when the vehicle is moving backward, and wherein each clutch produces an engaging force, the magnitude of which corresponds to a hydraulic pressure applied to the clutch;

a forward clutch valve for controlling the hydraulic pressure applied to the forward clutch;

a reverse clutch valve for controlling the hydraulic pressure applied to the reverse clutch;

a driving wheel, wherein the driving wheel is rotated by power that is transmitted from the transmission;

a sensor for detecting the rotational speed of the driving wheel; and

a controller for controlling the clutch valves, wherein the controller computes the rotational acceleration of the driving wheel when the vehicle is accelerating based on the detected rotational speed, and wherein, when the computed rotational acceleration exceeds [a predetermined] an acceleration determination value, which is predetermined for judging whether the driving wheel is skidding, the controller decreases an engaging force of one of the clutches that corresponds to the moving direction of the vehicle for decreasing the power transmitted to the driving wheel by controlling the corresponding clutch valve.

Please cancel claims 45, 46 and amend claim 48 as follows:

48. (Amended) An industrial vehicle comprising:

an engine;

a torque converter;

a transmission coupled to the engine by the torque converter, wherein the

transmission includes a hydraulic forward clutch, which is engaged when the vehicle is moving forward, and a hydraulic reverse clutch, which is engaged when the vehicle is moving backward, and wherein each clutch produces an engaging force, the magnitude of which corresponds to a hydraulic pressure applied to the clutch;

a differential;

a pair of driving wheels coupled to the transmission by the differential, wherein the differential permits the rotational speeds of the driving wheels to differ;

a pair of sensors, wherein each sensor detects the rotational speed of one of the driving wheels; and

[a skid detector for detecting skid values, each representing the degree of skidding of one of the driving wheels; and]

a controller for controlling the clutches, wherein the controller computes the rotational accelerations of the driving wheels when the vehicle is accelerating based on the detected rotational speeds, wherein, when the greater of the [detected skid values] computed rotational accelerations exceeds [a predetermined] an acceleration determination value [while the vehicle is accelerating], which is predetermined for judging whether each driving wheel is skidding, the controller decreases the engaging force of one of the clutches that corresponds to the moving direction of the vehicle for decreasing the power transmitted to the driving wheels.

Please cancel claim 49.